

WHAT IS CLAIMED IS:

1. A process for making (all-*rac*)- α -tocopherol comprising contacting a reaction mixture comprising trimethylhydroquinone and isophytol or phytol with a catalyst comprising hydrogen tris(oxalato)phosphate and an organic solvent for the reaction mixture.
2. A process according to claim 1 wherein the catalyst is added to the reaction mixture as an adduct in a catalyst solvent.
3. A process according to claim 2 wherein the catalyst solvent is an aliphatic ether.
4. A process according to claim 3 wherein the aliphatic ether is diethyl ether.
5. A process according to claim 1 wherein the catalyst for the reaction mixture is added to the reaction mixture in solution.
6. A process according to claim 5 wherein the solution is selected from the group consisting of an aliphatic ether, a dialkyl carbonate, and an alkylene carbonate.
7. A process according to claim 5 wherein the solution is a solvent used during preparation of the catalyst.
8. A process according to claim 1 wherein the reaction mixture solvent is selected from the group consisting of an aliphatic or cyclic ketone, a cyclic ester, a dialkyl or alkylene carbonate, an aliphatic or aromatic hydrocarbon, and mixtures thereof.

9. A process according to claim 8, wherein the reaction mixture solvent is selected from the group consisting of diethyl ketone, isobutyl methyl ketone, cyclopentanone, isophorone, γ -butyrolactone, dimethyl carbonate, diethyl carbonate, ethylene carbonate, propylene carbonate, hexane, heptane, octane, benzene, toluene, xylene, and mixtures thereof.

10. A process according to claim 1 wherein the reaction mixture solvent is a biphasic solvent system.

11. A process according to claim 10 wherein the biphasic solvent system comprises ethylene and/or propylene carbonate as a first phase and heptane as a second phase.

12. A process according to claim 1 wherein the amount of hydrogen tris(oxalato)phosphate used in the reaction mixture is from about 0.005 mole % to about 4 mole % based on the amount of trimethylhydroquinone or isophytol/phytol, which is present in the reaction mixture in the lesser molar amount.

13. A process according to claim 1 wherein about 10 - 100 ml of the organic solvent are used per 10 mmol of isophytol or phytol.

14. A process according to claim 13 wherein about 20 - 40 ml of the organic solvent are used per 10 mmol of isophytol or phytol.

15. A process according to claim 1 wherein the reaction is carried out at temperatures from about 50°C to about 150°C.

16. A process according to claim 15 wherein the temperature is about 90°C to about 125°C.

17. A process according to claim 16 wherein the temperature is from about 105°C to about 120°C.

18. A process according to claim 1 wherein the molar ratio of trimethylhydroquinone to isophytol/phytol present in the reaction mixture is from about 1 : 1 to about 2.5 : 1.

19. A process according to claim 18 wherein the molar ratio of trimethylhydroquinone to isophytol/phytol present in the reaction mixture is from about 1.5 : 1 to about 2.2 : 1.

20. A process according to claim 19 wherein the molar ratio of trimethylhydroquinone to isophytol/phytol present in the reaction mixture is about 2 : 1.

21. A process according to claim 1 wherein the contacting step further comprises adding the isophytol or phytol, alone or in solution, portionwise to a suspension or solution of the trimethylhydroquinone and the catalyst.

22. A process according to claim 1 wherein the process is carried out in a continuous manner.